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Comparing Hospital Costs & Lengths of Stay for Cancer Patients in New York State Comprehensive Cancer Centers vs. Non-Designated Academic Centers & Community Hospitals

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Abstract

This paper explores differences in costs and lengths of stay for cancer patients admitted to National Cancer Institute designated Comprehensive Cancer Centers, non-designated academic medical centers, and community hospitals in New York State. Using patient-level data from the New York State Statewide Planning and Research Cooperative System Hospital Inpatient Discharges dataset for the years 2017-2019, I employ ordinary least squares and Poisson regressions to determine that inpatient costs were 27% higher, but length of stay was 12% shorter, in comprehensive cancer centers than in non-designated academic medical centers and community hospitals. The results imply that, in New York State, comprehensive cancer centers may be a magnet for more complex oncology cases and administer more expensive treatments. That expertise, however, is probably responsible for more efficient care delivery and thorough discharge planning, allowing for shorter average lengths of stay.

Background

- Healthcare spending in 2020 accounted for **19.7% of gross domestic product**, totaling \$4.1 trillion, or **\$12,530 per person**¹. In New York State (NYS) alone, hospital care for all conditions accounted for nearly \$110 billion, or about 8% of NYS's 2020 real gross domestic product², and **cancer care is the seventh most expensive condition to treat in America**, accounting for 7% of all 2020 U.S. healthcare spending³.
- National Cancer Institute-designated Comprehensive Cancer Centers (NCICCC), are **academic hospitals designated by the NCI as having exceptional depth and breadth of basic, clinical, translational, and transdisciplinary research, as well as renowned leadership and resources dedicated to clinical cancer care**⁴. These centers are **magnets for cancer patients around the world**, thanks to their extraordinary expertise and outcomes. Their expertise and reputation may give NCICCCs greater leverage when negotiating reimbursement rates, makes them better equipped to efficiently handle complex oncology patients, and puts them on the forefront of drug development, so providers may be more attuned to the cost-effectiveness of pricey new treatments. However, there is **little research exploring the differences in costs and utilization between NCICCCs, non-NCI academic medical centers (AMC), and community hospitals**.

Methods

- I used the **New York State Statewide Planning and Research Cooperative System (SPARCS) Hospital Inpatient Discharges dataset**, retrieved from the NYS Department of Health website to get **data on every NYS hospital discharge from 2017-2019**⁵.
- Using **ordinary least squares (OLS) and Poisson regressions**, I determine the differences in the costs and lengths of stay for cancer-related admissions. **116,277 hospital stays are included in my analysis**.
- The four NCICCC in NYS are: Memorial Sloan Kettering, Columbia University Medical Center, NYU Langone Health, and Roswell Park Cancer Center

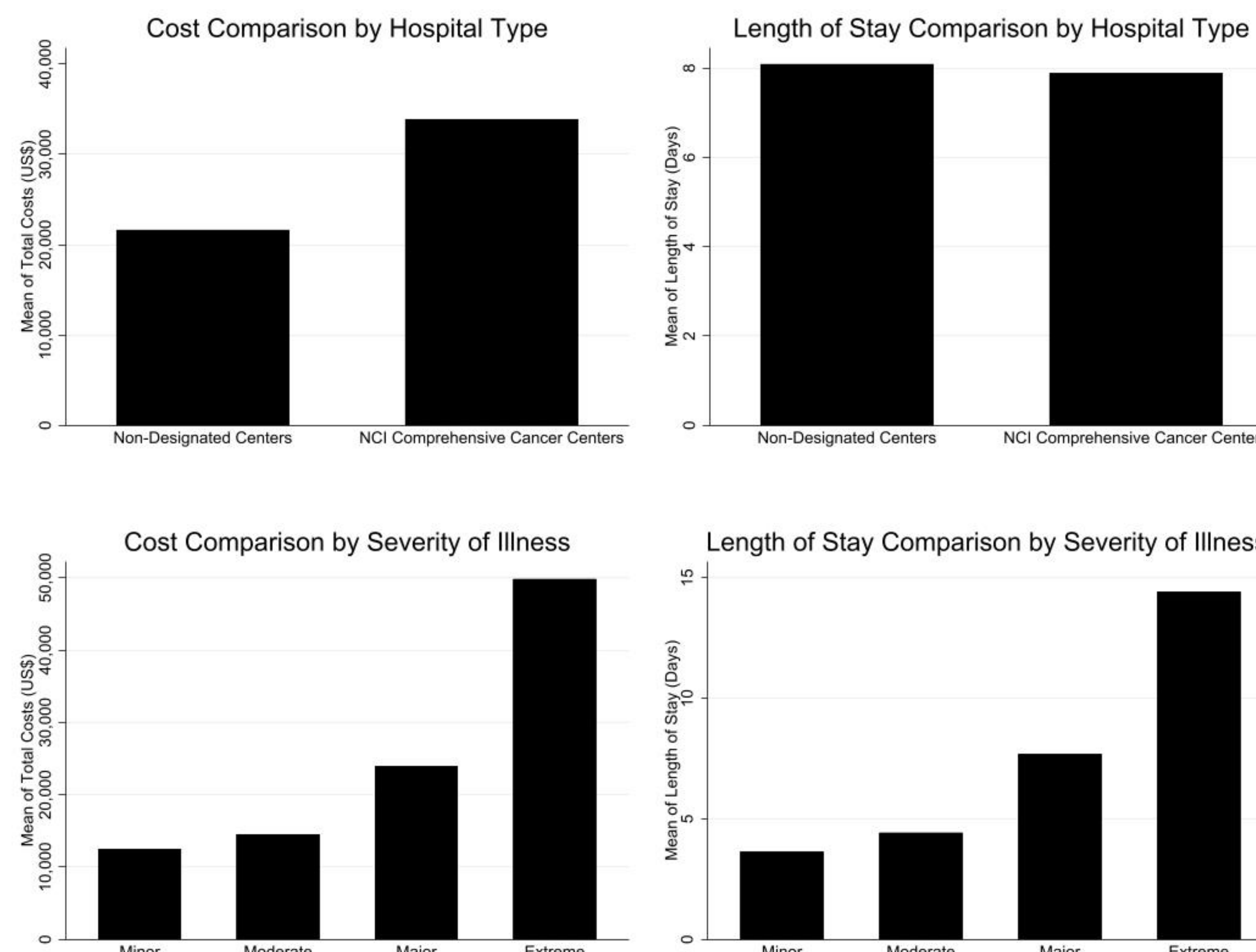
Eq. 1 $\ln Total Costs_{it} = \beta_0 + \beta_1 * NCICCC_{it} + \beta_2 * Controls_{it} + \beta_3 Time + \epsilon_{it}$

Eq. 2 $Length of Stay_{it} = \beta_0 + \beta_1 * NCICCC_{it} + \beta_2 * Controls_{it} + \beta_3 Time + \epsilon_{it}$

Regression Results Excluding Patients Discharged as Expired

VARIABLES	(1)	(2)
	ln(Total Costs)	Length of Stay
NCI-Designated Comp. Cancer Center	27%***	-12%***
Academic Medical Center	23%***	13.8%***
Black	18%***	14%***
Extreme Severity of Illness	247%***	309%***
Observations	130,364	130,364

Note: ***p<0.01, **p<0.05, *p<0.1



Conclusions

- The main regressions show that, on average, **total costs are 27% higher for cancer-related admissions in NCICCCs, but LOS is, on average, 12% shorter than in community hospitals**. In non-NCI AMCs total costs are also significantly higher than in community hospitals, though the increase is a smaller 23%. **LOS in non-NCI AMCs is significantly higher than in community hospitals (by almost a full day)**, a major contrast to the NCICCCs which saw shorter LOS relative to community hospitals.
- There are disparities in costs and LOS between races. For example, **Black cancer patients have, on average three-times higher costs (18% vs. 6%, p<0.01) and nearly two times longer LOS (14% vs. 8%, p<0.01) than white cancer patients**. Though it is impossible to determine the exact root cause of these racial disparities, it is reasonable to attribute them to the causes already described in the literature, including socioeconomic status and education level, poorer access to healthcare, lower prevalence of screening, and a lack of research focus on diverse groups, all of which can contribute to more advanced disease and increased mortality⁶.
- Next steps include pairing cost and LOS data with outcomes data to determine the level of cost-effectiveness for these admissions and addressing racial disparities.



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